

dividual forms or "sports." Unfortunately we meet quite often still with the old view that the naming of "aberrations, mutations," etc., is of no value. In opposition to this view I wish to say that we know a species only, if we are acquainted with *all* of its forms and their causes. In order to make all the forms known and to separate them from each other it is necessary to mark them in some way. Since, however, a designation of forms by letters or numbers cannot be carried out, we are obliged to give them names. Of course it is necessary only to characterize the extremes of each variation. Transition forms hardly need special names, or only in exceptional cases, as, for instance, for defining forms which develop at certain temperatures or for other definite causes.

The figures on Plate X are a little less than natural size and a shade too light.

The Species of *Nehalennia* (Odonata),

Including one from the eastern United States hitherto undescribed.

By PHILIP P. CALVERT, Ph.D.,

University of Pennsylvania, Philadelphia, Pa.

The genus *Nehalennia* was established by de Selys in 1850 for the European *Agrion speciosum* Charp. In his synopsis of the legion Agrion in 1876 he included within *Nehalennia* the following seven species: *atrinuchalis* Selys (Shanghai), *speciosa* Charp. (Europe), *irene* Hagen (United States), *sophia* Selys, 1876 (Province of Minas, Brazil), *posita* Hagen (United States), *denticollis* Burm. (Mexico), and *lais* Selys (Mexico). In 1895 Morse described *N. gracilis* from Massachusetts. Calvert removed *denticollis* to *Ischnura* Charp. in 1898 and *lais* to *Anisagrion* Selys in 1902. In 1903 Needham transferred *posita* to *Ischnura*. Five described species thus remain in *Nehalennia*. References to the literature are given in the catalogues of Kirby and of Muttkowski. Dr. E. M. Walker has just published the differentials of the larvae of *N. irene* and *gracilis*.*

*Can. Ent., XLV, p. 61, pl. I, figs. 1-3. June, 1913.

Some years previous to 1908 I had ascertained the presence of another species of this genus in the United States and had noted the principal characters distinguishing it from *irene*, *gracilis* and *speciosa*. On this basis, I included in my notes, furnished to the late Prof. John B. Smith in 1909, for the List of New Jersey Insects then in preparation, the record of one female from Malaga, N. J., June 27, 1908, by Mr. V. A. E. Daecke as *Nehalennia integricollis* Calv.* My absence for a year in Costa Rica speedily followed and the publication of the description of *integricollis* was forgotten, so that the name has remained a *nomen nudum*. A recent inquiry by Mr. W. T. Davis as to the place of description has recalled the matter to my mind, hence the present paper.

The species of *Nehalennia* are summarized in the following synopsis: two of them, *atrinuchalis* Selys and *selysii* Kirby (Cat. Odon., 1890, p. 147, for *sophia* Selys 1876; nec *sophia* Selys 1840 = *speciosa* Charp., 1840), are known to me by descriptions only.

- I. Hind margin of prothorax convex, entire or nearly so ♂ ♀. Superior appendages ♂ longer than inferiors.

Thoracic dorsum dull metallic green reaching laterad to beyond the humeral suture, with reddish humeral and antehumeral lines. Three antenodal cells. ♂ Abd. segs. 8 and 9 blue, 10 black dorsally, its hind margin broadly and shallowly concave; superior appendages subconical, a little recurved toward each other as if compressed. ♀ Abd. segs. 8 and 9 bronze dorsally. Abd. male 20-22, female 22; hind wing, male 13, female 16 mm. (From de Selys' description.) . . *atrinuchalis*

Thoracic dorsum metallic green to beyond the humeral suture which often has a short pale stripe on its upper and another on its lower end. Three antenodal cells. ♂ Abd. seg. 8 dark metallic blue or metallic green with a pale blue mid-dorsal spot on the posterior third to half and the sides inferiorly pale blue; 9 chiefly pale blue, a broad dark metallic green or metallic blue band each side in proximal two-thirds; 10 pale blue, its hind dorsal margin cleft in the middle, a short process directed upward and caudad on each side of the cleft, each process spinulose at tip, margin otherwise not spinulose; superior appendages increasing in thickness to the apex when seen

* Ann. Rep. N. J. State Museum 1909, p. 75. Trenton, N. J. 1910.

in profile view. ♀ Abd. segs. 8-10 colored similarly to those of the ♂ but the blue on the dorsum of 8 often reaching farther toward the base and the lateral band on 9 farther posteriorly. Abd. male 20-23, female 19-22; hind wing, male 13-14, female 14-15 mm. **speciosa**

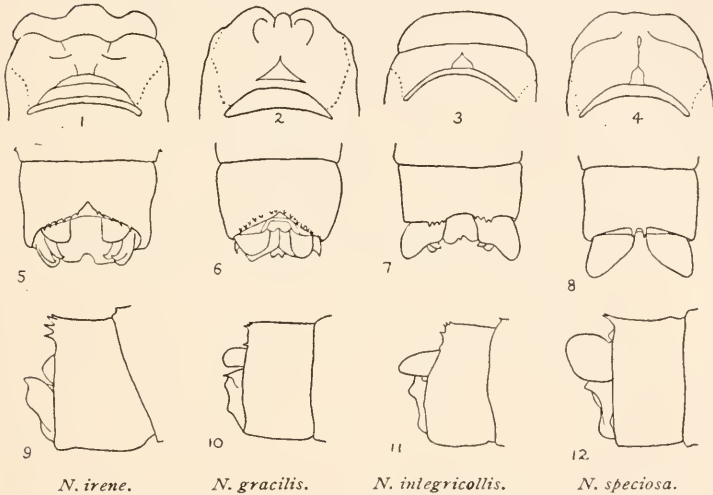
Thoracic dorsum bronze black not reaching as far laterad as the humeral suture which bears a black line. Three antenodal cells. ♂ Abd. segs. 8-10 pale blue with a bronze bilobed dorsal band on 8 and a small median spot on 9; hind margin of 10 forming two slightly marked festoons each bearing 5-6 blackish teeth; superior appendages conical, furnished at the base with an internal branch. Abd. 24-25, hind wing 15-15.5 mm. ♀ unknown. (From de Selys' description.) .. **selysii**

Thoracic dorsum ♂ bronze black reaching as far laterad as the humeral suture only at its upper sixth, the suture itself black, bordered mesad by a pale stripe one-fourth as wide as the mesepisternum on which it lies and reaching upward to five sixths of the length of the suture; of ♀ metallic green reaching laterad beyond the humeral suture which has a fine short yellow line on its upper and one on its lower end. Three (♂) or two (♀) antenodal cells. ♂ Abd. segs. 8 and 9 dark metallic blue, each with a narrow transverse pale line at base, interrupted at the middle on 8, and a narrower transverse pale line at the hind margin, sides pale blue which does not show in a dorsal view of 8 but is visible in a dorsal view of 9 especially near the hind end of the segment, no longitudinal lateral dark bands on 9; 10 pale blue with a little black at the base mid-dorsally, its hind dorsal margin concave in the middle, spinulose on each side of the emargination; superior appendages decreasing in thickness to the apex, seen in profile view. ♀ Abd. segs. 8 and 9 dark metallic blue-green, no pale dorsal spots on 8, a pale blue mid-dorsal posterior spot on 9 not half as long as the segment, sides inferiorly and 10 pale blue, the last with some traces of black or metallic green at the extreme base. Abd. ♂ 21, ♀ 18.5-20; hind wing, ♂ 13, ♀ 13-13.5 mm. **integrifollis** n. sp.

II. Hind margin of prothorax emarginated ♀, entire and convex ♂. Superior appendages ♂ equal to, or shorter than, the inferiors. Hind dorsal margin of abd. seg. 10 of ♂ cleft in the middle, spinulose on each side of the cleft. Thoracic dorsum metallic green, reaching laterad to beyond the humeral suture which is often marked as above stated for *speciosa*. Three antenodal cells.

Hind margin of prothorax of ♀ bilobed, but in front of the cleft
* separating the two lobes is a small more nearly erect process

which partly fills the cleft when the prothorax is viewed from in front, a median pair of slender approximated mesothoracic processes just behind the prothorax. ♂ Abd. seg. 8 blue with a transverse dorsal basal black or metallic green line or narrow stripe, 9 and 10 entirely pale blue; superior appendages nearly as long but not as high as the inf. apps., seen in profile view. ♀ Abd. seg. 8 pale blue with a transverse basal stripe and a lateral band reaching caudad therefrom dark metallic green or black, or, the dorsum of 8 almost entirely blue-black, sides inferiorly pale (1♀), 9 blue with a triangular black band each side in proximal half of segment, 10 entirely blue. Abd. ♂ ♀ 20-22; hind wing ♂ 13-14.5, ♀ 14-15 mm. *gracilis*



Figs. 1-4, hind part of prothorax of females viewed from in front and a little above, the head of each specimen having been removed to see the prothorax clearly; the dotted lines show the boundaries of the median metallic green and the lateral pale green or yellow. Figs. 5-8, dorsal views of abdominal segment 10 and appendages of males. Figs. 9-12, profile views, right side of the same. All the figures drawn to the same scale with the camera lucida, specimens illuminated by direct sunlight.

N. irene, ♀, Lehigh Gap, Pennsylvania, July 13, 1900; ♂, Berlin, New Jersey, July 17, 1893. *N. gracilis*, ♀, Lehigh Gap, Pa., June 29, 1897; ♂, Sherborn, Massachusetts, June 24, 1895 (co-type of Morse). *N. integricollis* n. sp., ♀, Enterprise, Fla., April 18, 1895 (type); ♂, Haulover, Fla., March. *N. speciosa*, ♀ ♂, Robenhausen, Switzerland, July 3, 1904.

Hind margin of prothorax of ♀ trilobed, no slender mesothoracic processes as described for *gracilis* but the mesostigmal laminae are larger and more projecting than in that species. ♂ Abd. seg. 8 dark metallic green, a mid-dorsal spot on the posterior fourth or less and the sides inferiorly pale blue, 9 pale blue with a triangular dark metallic green spot on each

side of dorsum in its proximal half or more, 10 pale blue with a metallic green spot each side of dorsum at base; superior appendages much smaller than the inferiors, each of the latter with two black-tipped hooks. ♀ Abd. segs. 8 and 9 dark metallic green, sides inferiorly pale, 9 with a mid-dorsal anteapical pale blue spot, *or*, more rarely, 8 and 9 colored as in the male, 10 as in the male. Abd. male 20-23, female 20-22.5; hind wing male 13-15.5, female 14-15 mm.**irene**

Of *Nehalennia integricollis* I have seen five females from Florida, one from Thomasville, Georgia, April 28, 1903, by Mr. Morgan Hebard, and the one from Malaga, New Jersey, mentioned above. Of the five Florida females, one, the type of the species, is from Enterprise, April 18, 1896, by Mr. Philip Laurent; it is the specimen cited in Ent. News, vii, p. 302, as *N. irene* Hag.; two others, exact locality not recorded, are due to Dr. D. M. Castle in 1903 (cf. Ent. News, xiv, p. 244); a fourth, "Fla. exchange," has long been unidentified in the collection of the Academy of Natural Sciences of Philadelphia, while the fifth, from Enterprise, May 17, belongs to the Museum of Comparative Zoology, Cambridge, Mass. Excepting this last, these females are in the collection of the Academy named.

The single male referred to this species, from Haulover, Florida, in March (Museum of Comp. Zool.), may not be conspecific with these females, as the extent of dark coloration on the thoracic dorsum and the number of antenodal cells are different, as has been indicated above. It resembles the description of *N. selysii* Kirby (*sophia* Selys 1876) in many respects, but is smaller, has the proximal and distal sides of the pterostigma nearly parallel (proximal side more oblique than the distal in *selysii*), the posterior or inferior side of the quadrilateral of front wing more than twice as long as the anterior or superior side ("l'inferieur moitié plus long que le supérieur" in *selysii*), labrum with a transverse basal black band ("un point médian enfoncé" in *selysii*), nasus entirely black. The abdomen is not fully colored, 3-6 being of a pale brown with a narrow transverse basal pale blue ring; other differences in abdominal coloring may be seen from the

above synopsis. The appendages may be quite similar to those of *selysii*. The known habitats of the two forms are far apart.

It will be noticed that, in spite of its geographical distribution, *integricollis* is nearer structurally to the European and Brazilian species than to the two already known from the United States.

Dr. F. Ris, within recent years, has described* color varieties in Swiss specimens of *N. speciosa* which may possibly indicate a color dimorphism or polymorphism among the females analogous to that known in *Ischnura*. In this connection it is of interest to note that I found a single female of *N. irene* from Manchester, Maine, June 12, 1899, by Miss Mattie Wadsworth (now in the collection of Mr. E. B. Williamson†), which has abdominal segments 8 and 9 colored as in the male of *irene* and unlike the majority of females as stated above. The alternative coloring of segment 8 in the female of *gracilis* mentioned above is seen in one specimen from Iona, New Jersey, July 13, 1902 (Daecke).

The transference of species from *Nehalennia* to *Ischnura*, mentioned in the first paragraph of this paper, indicates the difficulty of sharply distinguishing these two groups. Even now it does not appear to be possible to give any one character which will invariably separate them. The following statement may be of assistance:

Nehalennia. Prevailing color of dorsum metallic green. Second joint of antenna black, its middle third pale. Pale color on postero-superior part of head forming a transverse line whose extremities are not enlarged (except in ? *integricollis* male). M2 on the hind wings separating from M1 more often nearest the fourth postnodal. Males without an elevated, bifid, dorsal process on abdominal segment 10 (ap-

* *Farbenvarietäten der Agrionide Nehalennia speciosa* Charp. Mitt. schweiz. entom. Gesell. XI, pp. 159-165, 1906. Very recently this species has also been discovered in Asia by Bartenev, Zool. Anz. xxxv, p. 278, 1910; Ann. Mus. Zool. Acad. Imp. Sci. St. Petersburg. xvi, p. 447, 1912.

† Mr. Williamson kindly placed his collection of *Nehalennia* at my disposal for study.

proach thereto in *speciosa*), stigmata of front and hind wings similar in size, shape and color. Females without a vulvar spine.

Ischnura. Prevailing color of dorsum not metallic green. Second joint of antenna otherwise colored. Pale color on postero-superior part of head forming two round or cuneiform postocular spots sometimes united by a transverse line. M₂ on the hind wings separating from M₁ more often nearest the third postnodal (except in *I. erratica*, *I. cervula*, *I. in-armata* and possibly others). Males with an elevated, usually bifid, dorsal process on abdominal segment 10, stigmata of front and hind wings dissimilar in color, size or both (dissimilarity slight in *I. posita*). Females with or without a vulvar spine, in some cases even in the same species.

A new Erycinid from South America (Lepid.).

By LEVI W. MENGEL, Reading, Pa.

Chamaelimnas propinquus n. sp.

Expanse of spread insect, 1.38 in. *Male* (Fig. 1), upperside. Anterior wings, black. A broad orange band crosses the wing transversely, extending from the middle of the costa almost to the inner angle, cutting into the lowest median nervule. The band does not quite reach the costa. A sharp, triangular tooth-like projection of orange reaches from the transverse band, partially filling the space between the second and third sub-costal nervules, extending entirely to the base of the wing, where the angle is quite acute. There is an iridescent steel-blue spot at the apex of the wing.

Posterior wing has the basal half steel blue; the outer half, black.

The *female* (Fig. 2) is much the same, except that the orange band is very much broader and the triangular projection extends to the base along the costa and completely fills the space to the fourth sub-costal nervule. The iridescent spot in the apex is smaller and duller. The lower wing is the same as in the male.

